**12-lead ECG in Prehospital Care**

**Case Study #2**

**Authored by:**
William C. Wingo, BA, EMT-P
Titusville Area Hospital, Emergency Medical Service
Titusville, Pennsylvania

---

**Profile:**
A 52 year old female with no previous cardiac history called for EMS response. She complained of sudden onset and severe back pain radiating to the sternum which began while she was cutting brush. Risk factors included smoking and a positive family history. Symptoms began 40 minutes prior to the call. Call to scene time for BLS was 20 minutes. Hospital based ALS was dispatched to meet up with BLS en route.

---

**Clinical Assessment/Therapy**

<table>
<thead>
<tr>
<th><strong>BLS arrival</strong></th>
<th>Conscious, alert, oriented. Pain rating “10”. Diaphoretic. O$_2$ initiated, depart to meet ALS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:12 12-lead ECG with computer interpretation. Nitro spray 1 m.d. PO, no relief.</td>
<td>Marked ST segment elevation in leads V2, V3, V4, V5. <em><strong>ACUTE MI SUSPECTED</strong></em> message on printout.</td>
</tr>
</tbody>
</table>

16:14 Depart rendezvous site for hospital.

16:19 Nitro spray repeated x2, no relief. Prehospital t-PA checklist with no contraindications noted.

16:27 “I feel like I’m going to die”. Pain continues at “10”.

16:34 Contact medical command (previously unable due to distance/terrain). Relay 12-lead interpretation. Orders for up to 8.0 mg Morphine IV.
Clinical Assessment/Therapy

At hospital. 12-lead ECG repeated at ED entrance using the prehospital device. ST elevations persist in V leads.

16:45
17:02
17:04
17:11
17:20
17:40
22:24

18:40

Heparin bolus administered, heparin drip started.

ASA 2 tabs (peds dose) given.

Bolus of t-PA administered, t-PA infusion started.

Sudden loss of responsiveness. Cardiowension x2 at 200J. Intubated.

Admitted to ICU.

Extubated. Transferred for heart catheterization.

Significance of Prehospital 12-lead ECG

A positive finding of acute myocardial injury on the 12-lead ECG performed in the prehospital setting facilitated a rapid, targeted response by the ED staff prior to the arrival of this patient. Because the paramedic contacted the receiving hospital with 12-lead ECG findings of ***ACUTE MI SUSPECTED*** and thrombolytic eligibility, the internist was immediately available to assist the ED physician upon patient arrival. A confirming 12-lead ECG was performed without delay and “door to drug” time was 26 minutes.

Commentary

Complicating this scenario was the patient’s cardiac arrest. The diagnosis of AMI was made prior to arrest based on the prehospital and initial ED 12-leads and treatment was rapidly initiated. Had the arrest occurred with no prior 12-lead ECGs, AMI diagnosis and treatment would have been further delayed while resuscitation events took place.

ACLS recommendations for the early detection and treatment of patients with chest pain and possible AMI include prehospital screening for thrombolytic therapy and acquisition of 12-lead ECG.1 EMS providers are encouraged to employ these and other appropriate strategies to reduce the time to definitive treatment for AMI patients.2